

REMARKS/ARGUMENTS

This paper is in response to the Office Action dated June 11, 2010. In the Office Action, the Examiner objected to the Abstract because it contains legal terms such as “means.” In response, Applicant has amended the Abstract to resolve the issues, as shown above.

In the Office Action, Claims 1-31 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner pointed out several issues related to clarity and lack of antecedent basis. In response, Applicant has amended the claims to resolve these issues, as well as other similar clarity issues, as recommended by the Examiner. Applicant asserts that the scope of the invention has not been altered as a result of these minor amendments, and no new matter has been added. Accordingly, Applicant respectfully requests that the rejection of Claims 1-31 under 35 U.S.C. § 112 be withdrawn.

Additionally, Claims 1-2, 4, 12-13, 16, 18-21, and 24-30 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Pub. No. 2003/0219341 to Dovey et al.; Claims 3, 5, 9, 22-23, 26, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey; Claims 3, 5, 9, 22-23, 26, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of U.S. Patent No. 4,502,842 to Currier et al.; Claims 6-7, 10-11, 14, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of U.S. Patent No. 5,224,835 to Oltman; Claims 6-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Currier and further in view of Oltman; Claims 8 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Oltman and further in view of U.S. Patent No. 6,176,683 to Yang; Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dovey in view of Currier and further in view of Oltman and further in view of Yang; and Claim 31 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,179,630 to Stuber or U.S. Patent Application Pub. No. 2003/0161734 to Kim in further view of Dovey. In response, Applicant has amended Claims 1-31 to further clarify the present invention. The Examiner’s further consideration of this application is requested in light of the amendments made above and the following comments.

The present invention generally relates to a fluid pump that performs self calibration to maximize piston displacement within the pump's cylinder while minimizing collisions between the piston and the cylinder during normal operation of the fluid pump. As noted above, the Office Action rejects independent Claims 1, 12, 18, 27, and 30 of the present invention under 35 U.S.C. § 102(b) as being anticipated by Dovey.

Dovey generally discloses a vacuum pump incorporating a reciprocating piston for which a vibration sensor is used to control the piston stroke. In particular, Dovey discloses a vibration sensor mounted on a vacuum pump having a piston moving between two ends of a cylinder. If the vibration sensor detects a collision between the piston and either end point of the cylinder, the sensor sends a signal to the pump controller to reduce the drive voltage thereby reducing the piston stroke length. Dovey then continues to monitor the vibration sensor output to detect further collisions during operation of the vacuum pump.

Independent Claims 1, 12, 18, 27, and 30 recite additional features not disclosed by Dovey. For example, the independent claims all recite that the piston stroke of the fluid pump is increased until an impact between the piston and the cylinder occurs. By intentionally causing a collision between the piston and the cylinder, the present invention proactively determines the maximum stroke length of the piston for use during operation of the fluid pump. In contrast, Dovey acts reactively by only adjusting the stroke length of the piston "should the end of the piston 5 strike an end plate at either end 6, 7 of the pump cylinder 1" (Dovey, col. 2, lines 16-17). Therefore, it is possible in Dovey that a collision between the piston and the cylinder will never occur. As such, it is possible that the maximum stroke length as determined by the present invention may never be determined according to the description of Dovey.

Dovey also fails to teach or suggest storing a maximum value of piston displacement once the impact occurs, as recited in independent Claims 1, 12, 27, and 30. Rather, Dovey teaches reducing the drive voltage and continuing to monitor for further collisions. By storing the maximum value of piston displacement, the present invention allows the fluid pump to avoid further collisions by preventing the piston from exceeding this threshold. In fact, independent

Claim 12 explicitly recites that once the maximum value is stored, the piston displacement is monitored to prevent future displacement as far as the maximum value. This advantage is not provided by Dovey where the maximum value is not stored, thereby allowing the potential for the piston stroke to once again exceed the length that caused an earlier collision.

For at least these reasons, Applicant respectfully submits that Dovey fails to teach or suggest each and every recitation of independent Claims 1, 12, 18, 27, and 30, as amended. Accordingly, it is submitted that Claims 1, 12, 18, 27, and 30 are patentably distinct from Dovey. For similar reasons, Applicant submits that independent Claim 31, which recites an environment cooler comprising a control system as defined in Claim 1, is further patentable over the cited references.

The Applicant has made significant contributions to the art which are neither taught nor suggested by the cited prior art. Accordingly, it is submitted that the application is now in condition for allowance and such action is respectfully submitted. Should the Examiner have any questions, comments or proposed claim amendments, he is encouraged to contact the undersigned by telephone so that allowance of this application can be expedited.

The patentability of the independent claim has been argued as set forth above and thus the Applicant will not take this opportunity to argue the merits of the rejection with regard to the dependent claims. However, the Applicant does not concede that the dependent claims are not independently patentable and reserves the right to argue the patentability of the dependent claims at a later date if necessary.

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Amdt. dated October 21, 2010
Reply to Office Action of May 21, 2010

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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